

In the claims:

Please amend the claims as set forth below:

1 1. (Previously Presented) A method, in a data processing system having a plurality of computing
2 nodes, of managing incoming calls for an organization having a plurality of departments and a
3 plurality of agents, the method comprising the steps of:
4 receiving one or more incoming calls by a call manager object, a call manager object
5 being present in each of the plurality of computing nodes;
6 creating an associated call object for each incoming call in response to receiving the
7 incoming call;
8 playing to the caller a voice menu describing a plurality of selection items in a department
9 table corresponding to a department in the organization, each call object including the
10 department table with which the call is currently associated;
11 receiving one or more input signals from the caller in response to the voice menu played
12 to the caller; and
13 managing the incoming call according to a call-management policy based on the
14 information contained in the table and the input signals from the caller to attempt to reach one of
15 the plurality of agents of the organization.

1 2. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the step of receiving an incoming call includes the steps of:
3 listening for an incoming call; and
4 connecting to the incoming call when it occurs.

1 3. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the step of receiving one or more input signals from the caller includes the steps of:
3 receiving a selection event from the caller by the call object; and
4 determining from the selection event which of the selection items in the department table
5 was selected by the caller.

88781.2.17 6/10/2004

09/387,938

Page 2 of 22

1 4. (Original) A method of managing incoming calls as recited in claim 3, wherein the selection
2 event is a DTMF tone produced by the caller.

1 5. (Original) A method of managing incoming calls as recited in claim 3, wherein the selection
2 event is a recognized voice input from the caller.

1 6. (Previously Presented) A method of managing incoming calls as recited in claim 1,
2 wherein the table includes alternate routing information;
3 wherein the step of managing the incoming call according to a call-management policy
4 includes the steps of:
5 determining if an agent is available according to the department table described in
6 the voice menu;
7 if the agent is available, obtaining the agent's directory number from the table,
8 transferring the call to the agent, and disconnecting from the call; and
9 if the agent is not available, handling the call according to alternate routing
10 information.

1 7. (Currently Amended) A method of managing incoming calls as recited in claim 6, A
2 method, in a data processing system having a plurality of computing nodes, of managing
3 incoming calls for an organization having a plurality of departments and a plurality of agents, the
4 method comprising the steps of:
5 receiving one or more incoming calls by a call manager object, a call manager object
6 being present in each of the plurality of computing nodes;
7 creating an associated call object for each incoming call in response to receiving the
8 incoming call;
9 playing to the caller a voice menu describing a plurality of selection items in a department
10 table corresponding to a department in the organization, each call object including the
11 department table with which the call is currently associated, the department table including
12 wherein the alternate routing information includes voice mail box information and operator
13 information;

88781.2.17 6/10/2004

14 ~~receiving one or more input signals from the caller in response to the voice menu played~~
15 ~~to the caller; and~~
16 ~~managing the incoming call according to a call management policy based on the~~
17 ~~information contained in the department table and the input signals from the caller to attempt to~~
18 ~~reach one of the plurality of agents of the organization by:~~
19 ~~determining if an agent is available according to the department table described in the~~
20 ~~voice menu;~~
21 ~~obtaining the agent's directory number from the department table, transferring the call to~~
22 ~~the agent, and disconnecting from the call, if the agent is available; wherein the step of handling~~
23 ~~the call according to the alternate routing information includes the steps of:~~
24 determining whether or not voice mail box is available for the department according to
25 the department table, if the agent is not available;
26 if voice mail is available, recording a message from the caller and storing it in the voice
27 mail box, ~~if voice mail is available;~~
28 if voice mail is not available, determining whether the operator is available, ~~if voice mail~~
29 ~~is not available;~~
30 if the operator is available, transferring the caller to the operator, ~~if the operator is~~
31 ~~available; and~~
32 if the operator is not available, recording a message from the caller in the default mailbox
33 disconnecting from the caller, ~~if the operator is not available.~~

1 8. (Previously Amended) A method of managing incoming calls as recited in claim 1,
2 wherein the organization has an organization database; and
3 wherein the plurality of agents includes local agents and one or more remote agents, each
4 of which can have access to the organization database.

1 9. (Original) A method of managing incoming calls as recited in claim 8, wherein a remote agent
2 is connected to the organization through an ISDN line.

1 10. (Original) A method of managing incoming calls as recited in claim 9, wherein remote agents
2 communicate information to the organization over the D-channel of the ISDN using X.25
3 protocol.

1 11. (Original) A method of managing incoming calls as recited in claim 10, wherein the
2 information communicated includes agent status and queries not visible to the caller.

1 12. (Original) A method of managing incoming calls as recited in claim 8, wherein remote agents
2 can communicate to each other and to local agents over the Internet.

1 13. (Previously Amended) A method of managing incoming calls as recited in claim 1,
2 wherein the incoming call has caller ID information associated with it; and
3 wherein the step of managing the incoming call according to the call-management policy
4 includes:
5 transferring the incoming call to an agent based on the caller ID information; and
6 disconnecting from the call.

1 14. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the department table can contain Java objects.

1 15. (Original) A method of managing incoming calls as recited in claim 14, wherein a Java object
2 in the table is a voice menu file.

1 16. (Original) A method of managing incoming calls as recited in claim 14, wherein a Java object
2 in the table is an XML object.

1 17. (Original) A method of managing incoming calls as recited in claim 14, wherein a Java object
2 in the table is a file object.

1 18. (Original) A method of managing incoming calls as recited in claim 14, wherein a Java object
2 in the table is another table object.

1 19. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the department tables are JDBC-accessible tables.

1 20. (Previously Presented) A method of managing incoming calls as recited in claim 1,
2 wherein the department table has a plurality of rows and columns; and
3 wherein a row in the department table is selected by the input signals from the caller; and
4 wherein the columns of the selected row contain information used by the call manager
5 object to implement the call-management policy.

1 21. (Currently Amended) A method of managing incoming calls as recited in claim 20 ~~A method,~~
2 ~~in a data processing system having a plurality of computing nodes, of managing incoming calls~~
3 ~~for an organization having a plurality of departments and a plurality of agents, the method~~
4 ~~comprising the steps of:~~
5 ~~— receiving one or more incoming calls by a call manager object, a call manager object~~
6 ~~being present in each of the plurality of computing nodes;~~
7 ~~— creating an associated call object for each incoming call in response to receiving the~~
8 ~~incoming call;~~
9 ~~— playing to the caller a voice menu describing a plurality of selection items in a department~~
10 ~~table corresponding to a department in the organization, each call object including the~~
11 ~~department table with which the call is currently associated;~~
12 ~~— wherein the department table has a plurality of rows and columns,~~
13 ~~— wherein the rows are selected by the input calls from the caller, and~~
14 ~~— wherein the columns of the selected row contain information used by the call manager~~
15 ~~object to implement a call management policy, wherein the columns of the selected row include~~
16 ~~including fields for specifying: a voice menu file for the selected row, the availability of an agent,~~
17 ~~the agent's directory number, the availability of another department[,] and the availability of~~
18 ~~voice mail for the department for the call-management policy.[:]~~

88781.2.17 6/10/2004

09/387,938

Page 6 of 22

19 ~~receiving one or more input signals from the caller in response to the voice menu played~~
20 ~~to the caller; and~~
21 ~~managing the incoming call according to the call management policy based on the~~
22 ~~information contained in the table and the input signals from the caller to attempt to reach one of~~
23 ~~the plurality of agents of the organization.~~

1 22. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 each call object is an element of an array of call objects managed by the call manager object.

1 23. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the call manager object can invoke any one of the call objects to play a voice menu, record a
3 caller message, to transfer a call, or to obtain another department table for the call associated
4 with the call object.

1 24. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the call object is capable of being coupled to an ISDN PSTN system and capable receiving notice
3 of and responding directly to ISDN events upon their occurrence.

1 25. (Previously Amended) A method of managing incoming calls as recited in claim 1, wherein
2 the call manager object is capable of being coupled to an ISDN PSTN system and capable of
3 receiving notice of and responding directly to ISDN events upon their occurrence.

1 26. (Previously Amended) A method, in a data processing system having a plurality of
2 computing nodes, of managing incoming calls for an organization having a plurality of
3 departments, an organization database and a plurality of agents, the method comprising the steps
4 of:

5 (a) receiving an incoming voice call by a call manager object, a call manager object being
6 present in each of the plurality of computing nodes;

7 (b) creating an associated call object for each incoming call in response to receiving the
8 incoming call;

9 (c) playing to the caller a voice menu corresponding to a plurality of selection items in a
10 department table for the organization, each call object including the department table with which
11 the call is currently associated;

12 (d) receiving an input signal from the caller in response to the voice menu played to the
13 caller, the input signal specifying one of the plurality of selection items in the department table;

14 (e) determining whether or not an agent is available for the selected item in the
15 department table;

16 if an agent is available, (f) obtaining the agent's number from the department table and
17 transferring the call to the agent and continuing at step (h);

18 if an agent is not available and if another department table is available, (g) obtaining
19 another department table from the organization database and continuing at step (c); and

20 (h) disconnecting from the caller.

1 27. (Previously Amended) A method of managing incoming calls for an organization having a
2 plurality of departments, an organization database and a plurality of agents as recited in claim 26,
3 further comprising the steps of:

4 prior to step (h),

5 if another department table is not available, (j) determining from the table whether
6 department voice mail is available;

7 if department voice mail is available, (k) recording a voice message from the
8 caller;

9 if department voice mail is not available, (l) determining whether an operator is
10 available;

11 if the operator is available, (m) transferring the call to the operator; and

12 if the operator is not available, (n) recording a voice message from the caller.

1 28. (Previously Amended) A call management system for an organization having a plurality of
2 departments and a plurality of agents, comprising:

3 a plurality of computer processing nodes;

4 an ISDN interface adapter connected to multiple ISDN B-channels and at least one
5 computer processing node;
6 a main memory included in each computer processing node connected to an ISDN
7 channel, wherein the main memory stores a computer program instructing the computer
8 processing node to carry out the steps of:
9 receiving an incoming call from a caller by a call manager object;
10 creating an associated call object for each incoming call in response to receiving
11 the incoming call;
12 playing a voice menu corresponding to a plurality of selection items in a
13 department table for the organization to the caller over an ISDN B-channel, each call object
14 including the department table with which the call is currently associated;
15 detecting incoming signals from the caller on an ISDN-B channel in response to a
16 voice message played for the caller;
17 accessing the table based on the incoming signals from the caller; and
18 connecting the caller to any available agent according to a call-management policy
19 based on the table.

1 29. (Previously Presented) A storage medium for a data processing system having a plurality of
2 computing nodes, the medium having stored thereon a program for managing incoming calls for
3 an organization having a plurality of departments, and a plurality of agents, the program residing
4 on each computing node of the data processing system and instructing each node to carry out the
5 steps of:
6 receiving one or more incoming calls;
7 creating an associated call object for each incoming call in response to receiving the
8 incoming call;
9 playing to the caller a voice menu describing a plurality of selection items in a department
10 table corresponding to a department in the organization, each call object including the
11 department table with which the call is currently associated;
12 receiving one or more input signals from the caller in response to the voice menu played
13 to the caller; and

14 managing the incoming call according to a call-management policy based on the
15 information contained in the table and the input signals from the caller to attempt to reach one of
16 the plurality of agents of the organization.

1 30. (Currently Amended) A computer processing storage medium as recited in claim 29-A
2 ~~storage medium for a data processing system having a plurality of computing nodes, the medium~~
3 ~~having stored thereon a program for managing incoming calls for an organization having a~~
4 ~~plurality of departments, and a plurality of agents, the program residing on each computing node~~
5 ~~of the data processing system and instructing each node to carry out the steps of:~~
6 ~~—— receiving one or more incoming calls;~~
7 ~~—— creating an associated call object for each incoming call in response to receiving the~~
8 ~~incoming call;~~
9 ~~—— playing to the caller a voice menu describing a plurality of selection items in a department~~
10 ~~table corresponding to a department in the organization, each call object including the~~
11 ~~department table with which the call is currently associated, wherein the department table~~
12 ~~includes agent availability information and alternative routing information.[:]~~
13 ~~—— receiving one or more input signals from the caller in response to the voice menu played~~
14 ~~to the caller; and~~
15 ~~—— managing the incoming call according to a call-management policy based on the~~
16 ~~information contained in the department table and the input signals from the caller to attempt to~~
17 ~~reach one of the plurality of agents of the organization.~~

1 31. (Previously Presented) A call management software system for managing incoming calls to
2 an organization having a plurality of departments and a plurality of agents, the system
3 comprising:
4 a call object associated with each incoming call, the call object including a plurality of
5 call object methods and a table associated with a department, the table containing information to
6 guide the management of the incoming call; and
7 a call manager object being present in each of a plurality of computing nodes and
8 including a plurality of call manager object methods, the call manager object for creating a call

9 object for each incoming call, for embedding the table into the call object and for invoking
10 methods of the call object based on the information in the table to attempt to transfer the call to
11 an agent of the organization.

1 32. (Previously Amended) A call management software system for managing incoming calls to
2 an organization having a plurality of departments and a plurality of agents, as recited in claim 31,
3 further including a Java-ISDN interface program for implementing one or more of the call object
4 methods in native code and for providing an interface which allows the call manager object and
5 call objects to respond to hardware events pertaining to the incoming call.

1 33. (Previously Amended) A call management software system for managing incoming calls to
2 an organization having a plurality of departments and a plurality of agents as recited in claim 31,
3 wherein the table is a JDBC-accessible table.

1 34. (Previously Amended) A call management software system for managing incoming calls to
2 an organization having a plurality of departments and a plurality of agents as recited in claim 31,
3 wherein the table contains Java objects.

1 35. (New) A method, in a data processing system having a plurality of computing nodes, of
2 managing incoming calls for an organization having a plurality of departments and a plurality of
3 agents, the method comprising the steps of:
4 receiving an event indicating a call from a non-object software driver that is connected to
5 communication hardware;
6 receiving notice in a non-object driver interface software of the call event from the
7 software driver;
8 receiving notice by a call manager object of the call event from the driver interface
9 software, a call manager object being present in each of the plurality of computing nodes, and
10 each call manager object including an observer method, a table access method, and a call object
11 activation method;

12 activating a call object for each call in response to receiving notice of the call from the
13 driver interface layer, wherein the activated call object includes a department method for
14 embedding a department table into the activated call object, a play method for playing a voice
15 menu to a caller, a record method for recording a voice message from the caller, a get number
16 method for obtaining a number to which a call may be transferred, and a transfer method for
17 transferring calls to a number; and
18 embedding a department table into the activated call object by invoking the department
19 method of the call object, the embedded department table becoming the current department table,
20 wherein the department table includes an agent field that indicates whether or not a particular
21 agent is available;
22 causing the associated call object to play to the caller a voice menu by invoking the play
23 method of the activated call object, wherein the voice menu describes a plurality of selection
24 items in the current department table, the voice menu being sent to the caller via the interface and
25 driver software;
26 receiving, by using the observer method, a selection event input from the caller in
27 response to the voice menu played to the caller, wherein the selection event input is received via
28 the driver and interface software;
29 accessing, by using the table access method, the agent field in the current department
30 table in the activated call object based on the selection event input to determine whether or not a
31 particular agent is available; and
32 if the particular agent is available based on the current department table, obtaining the
33 particular agent's directory number by invoking the agent number method, and causing the call to
34 be transferred to the number of the particular agent, by invoking the transfer method of the
35 activated call object.

1 36. (New) A method of managing incoming calls as recited in claim 35,
2 wherein the activated call object includes a get next menu method for obtaining another
3 department table; and
4 further comprising,

5 if the agent is not available based on the current department table, obtaining
6 another department table, using the get next menu method of the activated call object, embedding
7 the other department table into the activated call object using the department method, the other
8 department table becoming the current department table, and accessing, by using the table access
9 method, the agent field in the current department table in the activated call object based on the
10 selection event input to determine whether or not a particular agent is available; and
11 if the particular agent is available based on the current department table, obtaining
12 the particular agent's directory number by invoking the agent number method, and causing the
13 call to be transferred to the number of the particular agent, by invoking the transfer method of the
14 activated call object.

1 37. (New) A method of managing incoming calls as recited in claim 35, wherein the selection
2 event is a DTMF tone produced by the caller.

1 38. (New) A method of managing incoming calls as recited in claim 35, wherein the selection
2 event is a recognized voice input from the caller.

1 39. (New) A method of managing incoming calls as recited in claim 35,
2 wherein the organization has an organization database; and
3 wherein the plurality of agents includes local agents and one or more remote agents, each
4 of which can have access to the organization database.

1 40. (New) A method, in a data processing system having a plurality of computing nodes, of
2 managing incoming calls for an organization having a plurality of departments and a plurality of
3 agents, the method comprising the steps of:
4 receiving one or more incoming calls by a call manager object, a call manager object
5 being present in each of the plurality of computing nodes, wherein the call manager object
6 includes an observer method and a table access method;
7 creating an associated call object for each incoming call in response to receiving the
8 incoming call, wherein the call object includes a department method for embedding a department

88781.2.17 6/10/2004

09/387,938

Page 13 of 22

9 table in the associated call object, a play method for playing a voice menu to a caller, a record
10 method for recording a voice message from the caller, a transfer method for transferring calls to a
11 party, and a department table that is accessible by the call manager object via its table access
12 method and includes a voice mailbox field and an agent field;
13 causing the associated call object to play to the caller a voice menu by invoking the play
14 method of the call object associated with the call, wherein the voice menu describes a plurality of
15 selection items in the department table corresponding to a department in the organization, the
16 department table being associated with the current call;
17 receiving, by means of the observer method, a selection event input from the caller in
18 response to the voice menu played to the caller;
19 determining whether or not the agent field and the voice mail box field are empty by
20 invoking the table access method of the associated call object;
21 causing a caller's voice to be recorded, based on a selection event input by the caller, by
22 invoking the record method of the associated call object; and
23 causing the call to be transferred, based on the selection event input of the caller, if the
24 agent field is not empty, by invoking the transfer method of the associated call object, wherein all
25 of said steps are performed by call object's interaction with said call manager, and without call
26 objects having to instantiate any additional objects.

1 41. (New) A framework for implementing a Java Based telephone call distribution system,
2 capable of managing the distribution of incoming calls to a plurality of agents, the framework
3 comprising:
4 at least one call object having a class corresponding to a first of two Java telephony object
5 types, and including a department table, each call object possessing at least a listen() method
6 capable of listening for specific types of calls, a dept() method capable of embedding a
7 department table in said call object, a transfer() method capable of initiating a call transfer, an
8 agent() method capable of accessing an agent field of said department table, a play() method
9 capable of playing to a caller a voice file retrieved from the department table, a record() method
10 capable of recording caller voice and saving through said department table, and a readDTMF()

11 method capable of accessing DTMF tones from a caller and using said tones as an index into
12 said department table;
13 a call manager object having a class corresponding to the second of two Java telephony
14 object types, and implemented in each node of the distributed system, said call manager object
15 creating a call object for each incoming call and possessing an observe() method capable of
16 observing events associated with said call object; and
17 an interface layer that is accessed by said call manager object and said call object and that
18 provides a Java native interface to ISDN driver software;
19 wherein said Java objects and said Java native interface software are capable of being
20 compiled by a Java compiler and executed on a Java Virtual machine with no other telephony
21 objects being required for operation.